To: McClintock, Katie[McClintock.Katie@epa.gov]
Cc: Hunter, Jeffrey (Perkins Coie)[JHunter@perkinscoie.com]
From: Eric Durrin
Sent: Sat 2/13/2016 3:20:28 AM
Subject: Bullseye Glass

Hello,

I left you a voice message earlier today. I have been working on gathering the information that you requested. Most of yesterday, and all of today has been devoted to working with the Oregon DEQ on new developments. The unexpected interruption put a hitch in my work flow.

I am going to compile the information you asked for with the information that the DEQ has requested. For the DEQ we are routing the information through legal channels. We are taking the time to make sure the information provided is complete and accurate.

Regards,

Eric E. Durrin
Controller

Bullseye Glass Company
3722 S.E. 21st Avenue | Portland, Oregon 97202 | U.S.A.
Phone: 503-232-8887 x103 | Fax: 503-238-9963

To: MONRO David[MONRO.David@deq.state.or.us]
From: McClintock, Katie
Sent: Fri 2/12/2016 3:34:37 PM
Subject: RE: MSDS is available at this site...

Yes. We will have to get off a few minutes before 9:30 though because our Regional Administrator has asked for a briefing at that time.

-----Original Message-----
From: MONRO David [mailto:MONRO.David@deq.state.or.us]
Sent: Friday, February 12, 2016 7:10 AM
To: McClintock, Katie <McClintock.Katie@epa.gov>; Koprowski, Paul <Koprowski.Paul@epa.gov>; Wroble, Julie <Wroble.Julie@epa.gov>; GRUNOW Greg <GRUNOW.Greg@deq.state.or.us>; Narvaez, Madonna <Narvaez.Madonna@epa.gov>; Bray, Dave <Bray.Dave@epa.gov>
Cc: Hedgpeth, Zach <Hedgpeth.Zach@epa.gov>; Downey, Scott <Downey.Scott@epa.gov>
Subject: RE: MSDS is available at this site...

I just had another meeting scheduled for 830, can we do 9 instead?

Please excuse any brevity, grammar or spelling as this was sent with a mobile.

-------- Original message --------
From: "McClintock, Katie" <McClintock.Katie@epa.gov>
Date: 02/11/2016 8:36 PM (GMT-08:00)
To: MONRO David <MONRO.David@deq.state.or.us>, KOPROWSKI Paul <Koprowski.Paul@epa.gov>, "Wroble, Julie" <Wroble.Julie@epa.gov>, GRUNOW Greg <GRUNOW.Greg@deq.state.or.us>, "Narvaez, Madonna" <Narvaez.Madonna@epa.gov>, "Bray, Dave" <Bray.Dave@epa.gov>
Cc: "Hedgpeth, Zach" <Hedgpeth.Zach@epa.gov>, "Downey, Scott" <Downey.Scott@epa.gov>
Subject: RE: MSDS is available at this site...

Hi Dave -

Yes I am free in the morning. What time is best for you and I will make it happen.

-----Original Message-----
From: MONRO David [mailto:MONRO.David@deq.state.or.us]
Sent: Thursday, February 11, 2016 8:34 PM
To: McClintock, Katie <McClintock.Katie@epa.gov>; Koprowski, Paul <Koprowski.Paul@epa.gov>; Wroble, Julie <Wroble.Julie@epa.gov>; GRUNOW Greg <GRUNOW.Greg@deq.state.or.us>; Narvaez, Madonna <Narvaez.Madonna@epa.gov>; Bray, Dave <Bray.Dave@epa.gov>
Cc: Hedgpeth, Zach <Hedgpeth.Zach@epa.gov>; Downey, Scott <Downey.Scott@epa.gov>
Subject: RE: MSDS is available at this site...

Thanks Katie! I'm really glad you got to make it to both sites. If you're in tomorrow I'm hoping we could chat in the morning. I'm "free" until 9 but things have been moving quite quickly. After 9 I'm pretty much booked until noon.

Afternoon has some pockets that could be scheduled too, perhaps Paul could set something up....

Please excuse any brevity, grammar or spelling as this was sent with a mobile.
-------- Original message --------

From: "McClintock, Katie" <McClintock.Katie@epa.gov>
Date: 02/11/2016 8:23 PM (GMT-08:00)
To: KOPROWSKI Paul <Koprowski.Paul@epa.gov>, "Wroble, Julie" <Wroble.Julie@epa.gov>, GRUNOW Greg <GRUNOW.Greg@deq.state.or.us>, MONRO David <MONRO.David@deq.state.or.us>, "Narvaez, Madonna" <Narvaez.Madonna@epa.gov>, "Bray, Dave" <Bray.Dave@epa.gov>
Cc: "Hedgpeth, Zach" <Hedgpeth.Zach@epa.gov>, "Downey, Scott" <Downey.Scott@epa.gov>
Subject: RE: MSDS is available at this site...

Looks to me like these compounds (sodium dichromate and potassium dichromate) are both hex 6 compounds, so all chromium used at uroboros is chromium 6 which does not bode well for the emissions at Harriet tubman. We don't yet know the relative quantities used and Uroboros was much less sophisticated (I'm sure that was clear to you all too) and very understaffed and had serious concerns about their ability to collect records. Their owner is also going on a long planned family vacation tomorrow for two weeks. Please let me know how hard you want me to push them on producing records such as batch tickets over the last 5 months (which will give us some idea of frequency). They can also give us purchase records for the chromium compounds, but we didn't ask for that at this point. They were ask to directly send duplicates to Dave Monro (we didn't know Greg was assigned at that point). One last interesting note about uroboros is that they said they rarely melt leaded glass (twice a year was his estimate), but the gas is so corrosive he has to bypass he recuperators to avoid damaging them. I can't even imagine how bad the ambient lead levels are during those melts.

Thanks Dave and Greg for your flexibility this morning in us going out. We thought of going last minute (the idea struck me at 7am Thursday) but thought it was very beneficial to see the relative difference in sizes and sophistication of the facilities. Please let me know if there is any more inspection download you want on either source from us. We appreciate your help and are here if you need anything from us.

Katie

From: Koprowski, Paul
Sent: Thursday, February 11, 2016 1:16 PM
To: Wroble, Julie <Wroble.Julie@epa.gov>; grunow.greg@deq.state.or.us; David Monro (MONRO.David@deq.state.or.us) <MONRO.David@deq.state.or.us>; Narvaez, Madonna <Narvaez.Madonna@epa.gov>; Bray, Dave <Bray.Dave@epa.gov>
Cc: McClintock, Katie <McClintock.Katie@epa.gov>; Hedgpeth, Zach <Hedgpeth.Zach@epa.gov>
Subject: MSDS is available at this site...

https://www.sciencelab.com/page/S/CTGY/10403

This is the company where Uroboros got the products from.

Paul

Paul Koprowski
U.S. EPA; Oregon Operations Office
805 SW Broadway, Suite 500
Portland, Oregon 97205
(503) 326-6363

To: McClintock, Katie[McClintock.Katie@epa.gov]
From: GRUNOW Greg
Sent: Thur 2/11/2016 11:18:41 PM
Subject: RE: Request for MSDS Copies

You bet!

From: McClintock, Katie [mailto:McClintock.Katie@epa.gov]
Sent: Thursday, February 11, 2016 1:39 PM
To: GRUNOW Greg
Subject: RE: Request for MSDS Copies

Thanks Greg! And I see you are the contact for Uroboros as well, thanks!

From: GRUNOW Greg [mailto:GRUNOW.Greg@deq.state.or.us]
Sent: Thursday, February 11, 2016 11:04 AM
To: McClintock, Katie <McClintock.Katie@epa.gov>
Subject: FW: Request for MSDS Copies

And it's me again!

As you requested, here are the MSDS sheets I got from Bullseye for some of their color additives. I had asked Bullseye for MSDS copies for their colorant additives that contain arsenic trioxide, cadmium, selenium, chromium, and/or lead. As chromates, the iron chromate and sodium bichromate products should both be Cr+6 materials, but, while labeled iron chromate, the MSDS that was supplied is actually for iron chromite, which would be a Cr+3 compound. I've asked Eric Durrin at Bullseye to clarify the product(s) being used.

Greg

Greg Grunow

Natural Resource Specialist

ODEQ Northwest Region

503-229-5690

grunow.greg@deq.state.or.us

From: Eric Durrin [mailto:ericdurrin@bullseyeglass.com]
Sent: Tuesday, February 09, 2016 11:59 AM
To: GRUNOW Greg
Subject: RE: Request for MSDS Copies

Hello Greg,

Here are the MSDS sheets for the colorants that you were asking about.

Regards,

Eric Durrin | Bullseye Glass Co. | 503-232-8887x103

To: GRUNOW Greg[GRUNOW.Greg@deq.state.or.us]
From: McClintock, Katie
Sent: Thur 2/11/2016 9:38:53 PM
Subject: RE: Request for MSDS Copies

Thanks Greg! And I see you are the contact for Uroboros as well, thanks!

From: GRUNOW Greg [mailto:GRUNOW.Greg@deq.state.or.us]
Sent: Thursday, February 11, 2016 11:04 AM
To: McClintock, Katie <McClintock.Katie@epa.gov>
Subject: FW: Request for MSDS Copies

And it's me again!

As you requested, here are the MSDS sheets I got from Bullseye for some of their color additives. I had asked Bullseye for MSDS copies for their colorant additives that contain arsenic trioxide, cadmium, selenium, chromium, and/or lead. As chromates, the iron chromate and sodium bichromate products should both be Cr+6 materials, but, while labeled iron chromate, the MSDS that was supplied is actually for iron chromite, which would be a Cr+3 compound. I've asked Eric Durrin at Bullseye to clarify the product(s) being used.

Greg

Greg Grunow

Natural Resource Specialist

ODEQ Northwest Region

503-229-5690

grunow.greg@deq.state.or.us

From: Eric Durrin [mailto:ericdurrin@bullseyeglass.com]
Sent: Tuesday, February 09, 2016 11:59 AM

To: GRUNOW Greg
Subject: RE: Request for MSDS Copies

Hello Greg,

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Regards,

Eric Durrin | Bullseye Glass Co. | 503-232-8887x103

To: McClintock, Katie[McClintock.Katie@epa.gov]
From: GRUNOW Greg
Sent: Thur 2/11/2016 7:06:40 PM
Subject: FW: Chromium Information Needed
ConfBusInfoExemptionProcedures.docx

And one last FYI…

This morning I sent Bullseye this e-mail requesting the Cr related info that I verbally requested last night. I asked that they provide it by the end of the day. Eric notified me a little while ago that he's working on it. I'll send you their response when I get it.

Greg

Greg Grunow
Natural Resource Specialist
ODEQ Northwest Region
503-229-5690
grunow.greg@deq.state.or.us

From: GRUNOW Greg
Sent: Thursday, February 11, 2016 9:56 AM
To: Eric Durrin (ericdurrin@bullseyeglass.com)
Cc: MONRO David; ARMITAGE Sarah
Subject: Chromium Information Needed

Good morning Eric,

As I mentioned when we met yesterday, DEQ needs information related to Bullseye's chromium usage in its products. In this information request I'm focusing on Cr+6. Please provide DEQ with the following information:

- The facility's glass production data for 10/06/2015 and 10/24/2015

- identify type and quantity of each product manufactured
- provide recipes and quantities of the raw materials used
- identify each Cr+3 and Cr+6 containing product and the respective quantity of Cr+3 and Cr+6 used for each day

- Please summarize the following information regarding the facility's Cr+6 usage:

- quantity of Cr+6 used per year
- approximate number of product batches run per year containing Cr+6

- quantity (expressed as a range) of Cr+6 used per batch
- Please summarize the following information regarding the facility's Cr+3 usage:
- quantity of Cr+3 used per year

DEQ has broad authority to request any and all information that it requires for the purpose of regulating stationary sources. This includes confidential business information. If you would like to request that portions of the information I've requested above be held confidential (exempt from public disclosure) it will be necessary to follow the procedure below. Also inserted below is a MSWord document that provides a more detailed explanation of this process. Please note that Oregon law and the federal Clean Air Act have broad public disclosure requirements and narrow exemptions concerning this treatment, so DEQ may be unable to honor your request should it relate to "emissions data." Oregon law requires that information deemed to be "emission data," including trade secrets, must be disclosed to the public.

Oregon Administrative Rule 340-214-0130
Information Exempt from Disclosure

(1) Pursuant to the provisions of ORS 192.410 to 192.505, all information submitted to DEQ is subject to inspection upon request by any person unless such information is determined to be exempt from disclosure pursuant to section (2) or (3).
(2) If an owner or operator claims that any writing, as that term is defined in ORS 192.410, is confidential or otherwise exempt from disclosure, in whole or in part, the owner or operator must comply with the following procedures:
(a) The writing must be clearly marked with a request for exemption from disclosure. For a multi-page writing, each page must be so marked.
(b) The owner or operator must state the specific statutory provision under which it claims exemption from disclosure and explain why the writing meets the requirements of that provision.
(c) For writings that contain both exempt and non-exempt material, the proposed exempt material must be clearly distinguishable from the non-exempt material. If possible, the exempt material must be arranged so that it is placed on separate pages from the non-exempt material.
(3) For a writing to be considered exempt from disclosure as a "trade secret," it must meet all of the following criteria:
(a) The information cannot be patented;
(b) It must be known only to a limited number of individuals within a commercial concern who have made efforts to maintain the secrecy of the information;
(c) It must be information that derives actual or potential economic value from not being disclosed to other persons;
(d) It must give its users the chance to obtain a business advantage over competitors not having the information; and
(e) It must not be emissions data.

I'd like to note to you that this information request is of high importance and DEQ would like this information as soon as possible. Please contact me and let me know if you will not be able to provide the information by close of business today. I will be out of the office tomorrow, so David Monro should be contacted in my absence. He may be contacted at: 503-229-5160 or monro.david@deq.state.or.us.

Eric, thank you very much for all your help and efforts in this matter.

Regards,

Greg Grunow
Natural Resource Specialist
ODEQ Northwest Region
503-229-5690
grunow.greg@deq.state.or.us

Air Quality Division
Department of Environmental Quality
Information Exempt from Disclosure

Both Oregon law and the federal Clean Air Act have broad public disclosure requirements and narrow exemptions. The Department of Environmental Quality (DEQ) is required to disclose most information, permitted not to disclose other information, and forbidden from disclosing a very small class of information. Usually, even information exempted from mandatory disclosure can be made public if disclosure is in the public interest. Information will generally be disclosed unless: it is submitted in accordance with the proper procedures, it qualifies for exemption, and the source's interest in confidentiality outweighs the public interest in disclosure.

PROCEDURE FOR CLAIMING EXEMPTION FROM DISCLOSURE

OAR 340-214-0130 describes procedures for submitting a claim of exemption.

Stated statutory basis
A request that information submitted to DEQ be exempt from disclosure must include an explanation of the statutory basis for exemption. If more than one statute applies, the request must clearly indicate which information is claimed exempt under each statute.

Clearly distinguished information
Proposed exempt information must be clearly distinguishable from non-exempt information. The information may be on separate, appropriately marked pages, or the source may submit two versions of the document, one for use by the public, and one for use by regulators. If the source chooses to submit two versions, one version shall contain only non-exempt information, and one shall contain both non-exempt and proposed exempt information. On any page containing both non-exempt and proposed exempt information, the two must be clearly distinguishable. Any information not clearly identified as proposed exempt will be treated as public information.

A request for exemption does not necessarily mean that information will be exempted from public disclosure. The Department will review all information marked as proposed exempt before taking any action on it.

INFORMATION ELIGIBLE FOR EXEMPTION FROM DISCLOSURE

Oregon law allows some information submitted by sources to be exempt from public disclosure requirements. The provisions for exemption are outlined in the Public Records Act, Oregon Revised Statutes (ORS) 192.410 to 192.505, and the Uniform Trade Secrets Act, ORS 646.461 to 646.475.

Specific exemptions
The Attorney General's Public Records and Meetings Manual published in September, 1997 interpreted the Public Records Law and the Uniform Trade Secrets Act. Records withheld from disclosure [as trade secrets] must meet all of the following criteria:

1. The information must not be patented;
2. It must be known only to certain individuals within an organization and used in a business the organization conducts;
3. It must be information which derives actual or potential economic value; and

4. It must give its users the chance to obtain a business advantage over competitors who do not know or use it.

Other exemptions are listed in ORS 192.501 and 192.502, and will only be considered by DEQ if a source claims exemption under a specific paragraph of those statutes. In addition, ORS 468.095(2) prohibits DEQ from disclosing trade secret information, other than emission data, classified by the director as "confidential."

"Emission data"

"Emission data" **must be disclosed**, even if it qualifies as a trade secret. The Air Quality Division interprets "emission data" in accordance with EPA's definition:

40 CFR 2.301(a)(2)(i) defines "emission data" as:

(A) Information necessary to determine the identity, amount, frequency, concentration, or other characteristics (to the extent relevant to air quality) of any emission which has been emitted by the source, (or of any pollutant resulting from any emission by the source), or any combination of the foregoing;

(B) Information necessary to determine the identity, amount, frequency, concentration, or other characteristics (to the extent related to air quality) of the emissions which, under an applicable standard or limitation, the source was authorized to emit (including, to the extent necessary for such purposes, a description of the manner or rate of operation of the source);

(C) A general description of the location and/or nature of the source to the extent necessary to identify the source and to distinguish it from other sources (including, to the extent necessary for such purposes, a description of the device, installation, or operation constituting the source).

40 CFR 2.301(a)(2)(ii) makes some exceptions for research information, and for information concerning as-yet unmarketed products, methods, devices, or installations intended for commercial use.

Examples of information which must be disclosed

1. Emissions data and emission factors.
2. The source of emission factors.
3. Other information used to calculate emissions and permit compliance.
4. Emissions fee data.
5. Production information which has been made a matter of public record somewhere, such as in an annual financial report to the stockholders of a company.

To: McClintock, Katie[McClintock.Katie@epa.gov]
From: GRUNOW Greg
Sent: Thur 2/11/2016 7:04:03 PM
Subject: FW: Request for MSDS Copies
Arsenic.pdf
Cadmium.pdf
Chrome Oxide.pdf
Iron Chromate.pdf
Lead Frit.pdf
Selenium.pdf
Sodium Bichromate.pdf

And it's me again!

As you requested, here are the MSDS sheets I got from Bullseye for some of their color additives. I had asked Bullseye for MSDS copies for their colorant additives that contain arsenic trioxide, cadmium, selenium, chromium, and/or lead. As chromates, the iron chromate and sodium bichromate products should both be Cr+6 materials, but, while labeled iron chromate, the MSDS that was supplied is actually for iron chromite, which would be a Cr+3 compound. I've asked Eric Durrin at Bullseye to clarify the product(s) being used.

Greg

Greg Grunow

Natural Resource Specialist

ODEQ Northwest Region

503-229-5690

grunow.greg@deq.state.or.us

From: Eric Durrin [mailto:ericdurrin@bullseyeglass.com]
Sent: Tuesday, February 09, 2016 11:59 AM
To: GRUNOW Greg
Subject: RE: Request for MSDS Copies

Hello Greg,

Here are the MSDS sheets for the colorants that you were asking about.

Regards,

Eric Durrin | Bullseye Glass Co. | 503-232-8887x103

PRINCEMINERALS®

MATERIAL SAFETY DATA SHEET

Prince Minerals, Inc.
14 E 44th St
5th Floor
New York, NY 10017

CONTACT NUMBERS:
Prince Environmental, Health & Safety:
(646) 747-4176
CHEMTREC (24-hrs): (800) 424-9300

Section I: Product Information

Identity: CHROMITE Iron
Synonyms: CHROME ORE, CHROMITE ORE, IRON CHROMITE; CHROME SAND

Trade Names: CHROMOX; ChromeCAST;

Revision Date: 02/2011

HMIS

Health- 2
Flammability- 0
Reactivity- 0
Personal Protection:

Section II: Composition

Chemical Name:	CAS #	Percent
Chrome Ore (Cr_2FeO_4) or Cr_2O_3	1308-31-2	100

Rec'd 2/19/13

Section III: Health Hazard Data

Component	CAS	% By Wt	OSHA PEL (mg/m^3)	OSHA Ceiling	ACGIH TLV	ACGIH STEL	Listed Carcinogen		
							NTP	IARC	OSHA
Chrome Ore	1308-31-2	100	1 (as Cr)	N/A	0.05 (as Cr)	N/A	N	Y*	N

* IARC Group: Not classifiable as carcinogenic to humans

Emergency Overview: Not a fire or spill hazard. Low toxicity- Dry dust is a nuisance particulate. Generally, health effects are provided for exposure to dust that may be generated during product transfer and handling.

Primary Route of Exposure: Inhalation

Relevant Routes of Exposure:

EYE CONTACT: Particulate may cause slight to moderate irritation. Abrasive action of dust particulate can damage eye.
SKIN CONTACT: Prolonged or repeated contact may cause slight to moderate irritation.
INHALATION: Overexposure by inhalation of airborne particulate, dust, or fumes is irritating to the nose, throat, and respiratory tract. Inhalation of excessive levels of dust or fumes may be harmful.
INGESTION: Unlikely route of exposure; no hazard in normal industrial use. Small amounts (< tablespoonful) swallowed during normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. If ingested in sufficient quantity, may cause gastrointestinal disturbances. Symptoms may include irritation, nausea, vomiting, abdominal pain, and diarrhea.

Acute and Chronic effects of Exposure:

Excessive, short-term exposure to airborne mineral dusts and particulate may cause upper respiratory and eye irritation. Excessive, long-term inhalation of airborne mineral dusts and particulate may contribute to the development of bronchitis, reduced breathing capacity, and may lead to the increased susceptibility to lung disease.

Signs and Symptoms of Exposure:	(Dust) tearing of eyes, burning sensation in the throat, cough, and chest discomfort.
Aggravation of Pre-existing Conditions:	The excessive inhalation of mineral dust may aggravate pre-existing chronic lung conditions such as, but not limited to, bronchitis, emphysema, and asthma.
Reproductive Hazards:	Not a reproductive hazard.

Section IV: First Aid

Emergency and First Aid Procedures:

EYE CONTACT: Flush eyes immediately with water for at least 15 minutes. Seek medical attention if irritation persists.
SKIN CONTACT: Immediately wash affected area with mild soap and water to remove any dust adhering to the skin. Seek medical attention if irritation develops or persists.
INHALATION: If exposed to excessive levels of dust or fumes, remove to fresh air and seek medical attention if cough or other symptoms develop. If not breathing, give artificial respiration or give oxygen by trained personnel, and get medical attention.
IF INGESTED: Unlikely route of exposure. If ingested in sufficient quantity and victim is conscious, give 1-2 glasses of water or milk. Never give anything by mouth to an unconscious person. Leave decision to induce vomiting to qualified medical personnel, since particles may be aspirated into the lungs. Seek immediate medical attention.

Section V: Fire and Explosion Hazard Data

Emergency Overview:	Not a fire or spill hazard. Low toxicity; dry dust is a nuisance particulate. Generally, health effects are provided for exposure to dust that may be generated during product transfer and handling.
Flammable Properties:	Material will not burn. No unusual fire or explosion hazards.
Extinguishing Media:	Use extinguishing media appropriate to combustibles in the surrounding area.
Protection for Firefighters:	Wet material should be kept out of eyes and off skin. As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Material does not give off toxic fumes in a fire unless molten.

Section VI: Accidental Release

Containment:	Product is a dry solid (granular or powder) and not readily soluble in water. However, prevent spilled product from entering streams, water bodies, and wastewater systems.
Cleanup:	Vacuum or sweep up dry material and place in a container for reuse. Avoid creating excessive airborne dust. It is recommended that cleanup personnel wear approved respiratory protection, gloves, long sleeved clothing and goggles to prevent irritation from contact and inhalation.
Collection:	If possible, collect and reuse spilled product.
Evacuation:	Isolate hazard area. Keep unnecessary and unprotected personnel from entering area.
Potential Environmental Effects:	Derived from natural ores; no adverse environmental effects known. However, prevent spilled product from entering streams, water bodies, and wastewater systems

Section VII: Precautions for Safe Handling and Use

Handling: Minimize dust generation and accumulation. Avoid breathing dust. Avoid contact with skin and eyes.

Storage: Store in cool, dry area. Keep container closed when not in use.

Waste Disposal: If possible, collect and reuse spilled product. Disposal Method: Follow all applicable Federal, State, and local laws, rules, and regulations regarding the proper disposal of this material

Section VIII: Control Measures/ PPE Requirements

Engineering Controls: Minimize dust generation and accumulation. Avoid breathing dust. Keep exposure below the exposure limits listed in Section III.

Personal Protective Equipment:

Eye Protection: Corrosive to eyes. Wear protective safety goggles when dust generation is likely.
Skin Protection: Wear clothing sufficient to cover the skin, safety shoes, and leather gloves for hand protection against dry material.
Respiratory Protection: Use NIOSH/MSHA approved respiratory protection (air purifying or air supplying) when concentrations are above exposure limit value. A respiratory protection program that meets OSHA 29 CFR part 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant the use of a respirator.

Good Hygienic Practice: Wash thoroughly after using product. Wash contaminated clothing. Wash hands before eating or drinking.

Section IX: Physical and Chemical Properties

Bulk density:	180-200 lbs/ft^3	**Freeze Point:**	Solid at STP	**% volatile by vol:**	0% H_2O
Water solubility:	Insoluble	**Melting Point:**	>3400 °F	**Vapor Density:**	N/A
pH: (10% aqueous slurry)	N/A	**Boiling Point:**	N/A	**Vapor Pressure:**	N/A

Appearance and Odor: Chrome ore is usually black, but does show some variation from iron-black to brownish black with some brown streaks. Various grades can vary from large pieces down to fine powders. Odorless.

Section X: Stability/ Reactivity Data

Stability: Stable under normal conditions of storage.
Conditions to Avoid: None under normal conditions.
Incompatibility (materials to avoid): Chrome ore can react at high temperature with molten alkalis and alkali vapors forming water-soluble chromium salts.
Hazardous Decomposition or Byproducts: None under normal conditions.
Hazardous Polymerization: Will not occur.

Section XI: Toxicological Properties

Component	CAS	RTECS Toxicity
Chrome Ore	1308-31-2	N/A

Section XII: Ecological Information

Material derived from mineral ores. No data available on any adverse effects of this material on the environment.

Section XIII: Disposal Considerations

RCRA: As manufactured, this product is not a RCRA listed hazardous waste and does not exhibit any characteristics of a hazardous waste, including TCLP.

Disposal Method: This product is generally suitable for landfill disposal. Follow all applicable Federal, State and local laws regarding proper disposal. If this product has been altered or contaminated with other hazardous materials, appropriate waste analysis may be necessary to determine method of disposal.

Section XIV: Transportation Information

USDOT: Not regulated

Section XV: Regulatory

Note: Prince Minerals, Inc.'s chromite ore is mined from the Transvaal Region of South Africa. This ore and the un-reacted ore component of the chromite ore processing residue are exempt from the reporting requirements under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (EPCRA) and Section 6607 of the Pollution Prevention Act of 1990 (PPA). See 66FR24066 for complete citation.

RCRA:	No
CERCLA:	No
SARA:	No
TSCA:	Not Regulated

Safety Data Sheet

In accordance with CFR 1910.1200 (OSHA HCS)

Date of review: June 2, 2015

SDS No. 150

1 Identification of substance and company

Product name: *Arsenic (III) oxide*

Product code: 11471, 11608, 17523, 18864, 90916

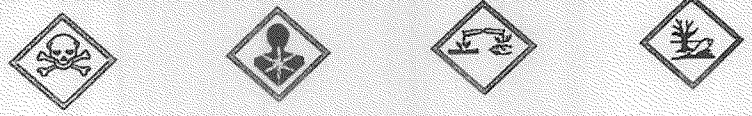
Relevant use and restrictions on use: Research and product development

Manufacturer/Supplier:
Noah Technologies Corporation
1 Noah Park
San Antonio, Texas 78249-3419
Phone: 210-691-2000
Fax: 210-691-2600
Web site: www.noahtech.com

Emergency information:
CHEMTREC
800-424-9300

2 Hazards identification

Emergency Overview:



Signal word(s): Danger

Pictogram(s):
Skull and crossbones
Health hazard
Corrosion
Environment

Hazard statements:
H300 Fatal if swallowed
H314 Causes severe skin burns and eye damage
H318 Causes serious eye damage
H350 May cause cancer
H410 Very toxic to aquatic life with long lasting effects

Precautionary statements:
P260 Do not breathe dust or mist
P264 Wash skin thoroughly after handling
P270 Do not eat, drink or smoke when using this product
P273 Avoid release to the environment
P280 Wear protective gloves/protective clothing/eye protection/face protection
P301/310/330 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Rinse mouth.
P303/361/353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304/340/310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor/physician
P305/351/338/310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

Hazards not otherwise classified: None

Ingredients of unknown acute toxicity: None

GHS Classification:
Acute toxicity, Oral - 2
Skin corrosion - 1B
Serious eye damage - 1
Carcinogenicity - 1A
Acute aquatic toxicity - 1
Chronic aquatic toxicity - 1

HMIS ratings (scale 0-4):

Health hazard:	3*
Flammability:	0
Physical hazard:	0

3 Composition/information on ingredients

Chemical name: Arsenic (III) oxide

Designation:

CAS number: 1327-53-3

EC number: 215-481-4

Formula: As_2O_3

Synonyms: Arsenic trioxide, arsenious acid

Ingredients of known acute toxicity: Arsenic (III) oxide

Rec'd 8/19/15

4 First aid measures

After inhalation:	Move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
After skin contact:	Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.
After eye contact:	Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.
After ingestion:	Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.
Information for doctor:	Show this safety data sheet to the doctor in attendance
Symptoms/effects; acute and delayed:	Ingestion results in marked irritation of the stomach and intestines with nausea, vomiting, and diarrhea. In severe cases, the vomitus and stools are bloody and the patient goes into collapse and shock with weak, rapid pulse, cold sweats, coma and death. Chronic poisoning may manifest itself in different ways. There may be disturbances of the digestive system such as cramps, nausea, constipation, or diarrhea. Liver damage may occur. Disturbances of the blood, kidneys and nervous system may occur.
Immediate medical attention and special treatment needed:	See above

5 Fire-fighting measures

Suitable and unsuitable extinguishing agents:	Water spray, alcohol-resistant foam, dry chemical or carbon dioxide
Special hazards caused by the material, its products of combustion or resulting gases:	Oxides of arsenic
Special fire fighting procedures:	Wear self-contained breathing apparatus and fully protective fire fighting equipment/clothing
Unusual fire and explosion hazard:	No available data

6 Accidental release measures

Person-related safety precautions:	Wear respiratory protection. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation.
Measures for environmental protection:	Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.
Measures for cleaning/collecting:	Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for proper disposal.
Additional information:	See Section 7 for information on safe handling See Section 8 for information on personal protective equipment See Section 13 for information on disposal See Section 15 for regulatory information

7 Handling and storage

Information for safe handling:	Avoid contact with skin and eyes. Avoid dust formation. Provide appropriate exhaust ventilation.
Information about protection against explosions and fires:	No data available
Storage requirements to be met by storerooms and containers:	Keep container tightly closed in a dry and well-ventilated place
Incompatibility (avoid contact with):	Strong acids and oxidizers. Reacts rigorously with rubidium carbide, chlorine trifluoride, fluorine, mercury, sodium chlorate, tannic acid, inter-halogens
Further information about storage conditions:	May decompose on exposure to moist air or water

8 Exposure controls/personal protection

Ventilation requirements:	Local exhaust, chemical fume hood
Components with exposure limits that require monitoring:	OSHA PEL: TWA 0.01 mg(As)/m3 ACGIH TLV: TWA 0.01 mg(As)/m3; Target organs; liver, kidneys, skin, CNS, respiratory system, lungs
Additional information:	No additional data available
General protective and hygienic measures:	The usual precautionary measures for handling chemicals should be adhered to Keep away from foodstuffs, beverages and food Instantly remove any soiled and impregnated garments Wash hands during breaks and at the end of the work Avoid contact with the eyes and skin
Personal protective equipment:	
Respiratory protection: **(Use only NIOSH or CEN approved Equipment)**	Filter-dust, fume, mist; respirator equipped with HEPA
Hand protection:	Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique.
Eye protection:	Safety glasses, goggles
Skin protection:	Completely covering work attire with full length apron
Additional protective equipment:	Sufficient to prevent contact. Emergency eyewash and safety shower
Precautionary labeling:	Wash thoroughly after handling Do not get in eyes, on skin or on clothing Do not breathe dust, vapor, mist, gas Keep away from heat, sparks, and open flames Empty container may contain hazardous residues

9 Physical and chemical properties

Physical state:	Powder
Color:	White to off-white
Odor:	Odorless
Odor threshold:	Not determined
Molecular Weight (Calculated):	197.84
pH	Not determined
Melting point/freezing point/range:	312.3 C
Boiling point/range:	457.2 C
Sublimation temperature/start:	Not determined
Decomposition temperature:	Not determined
Flammability (solid, gas):	Not determined
Flash point:	Not determined
Autoignition temperature:	Not determined
Danger of explosion:	Not determined
Flammable limits:	
Lower:	Not determined
Upper:	Not determined
Evaporation Rate:	Not determined
Vapor pressure (mm Hg):	0.000001 mm Hg @ 66 C
Vapor density:	Not determined
Specific gravity:	3.738
Bulk density:	Not determined
Solubility in/Miscibility with water:	37 g/L @ 20 C
Partition coefficient n-octanol/water:	log Pow: 5
Viscosity:	Not determined
Other information:	Not determined

10 Stability and reactivity

Reactivity:	Not determined
Chemical stability:	Stable under recommended storage conditions
Possibility of hazardous reactions:	Not determined
Conditions to be avoided:	Heat, contact with incompatibles
Materials to be avoided:	See section 7 for information on proper handling and storage
Dangerous reactions:	Reacts rigorously with rubidium carbide, chlorine trifluoride, fluorine, mercury, sodium chlorate, tannic acid, inter-halogens
Hazardous decomposition products: (thermal and other)	Oxides of arsenic

11 Toxicological information

LD/LC50 values that are relevant for classification:	oral-rat LD_{50}: 14.6 mg/kg
Irritation or corrosion of skin:	No data available
Irritation or corrosion of eyes:	No data available
Primary irritant or corrosive effect:	
on the skin:	Causes severe skin burns
on the eye:	Causes serious eye damage
Sensitization:	No data available
Potential health effects:	
Inhalation:	May cause serious respiratory tract damage
Ingestion:	Severe irritation of the stomach and intestines
Skin:	Severe skin burns
Eyes:	Serious eye damage
Signs and symptoms of exposure:	Ingestion results in marked irritation of the stomach and intestines with nausea, vomiting, and diarrhea. In severe cases, the vomitus and stools are bloody and the patient goes into collapse and shock with weak, rapid pulse, cold sweats, coma and death. Chronic poisoning may manifest itself in different ways. There may be disturbances of the digestive system such as cramps, nausea, constipation, or diarrhea. Liver damage may occur. Disturbances of the blood, kidneys and nervous system may occur.
Carcinogenicity:	To the best of our knowledge the acute and chronic toxicity of this substance is not fully known EPA-A: Human carcinogen: sufficient evidence from epidemiologic studies IARC-1: Carcinogenic to humans: sufficient evidence of carcinogenicity NTP-1: Known to be carcinogenic: sufficient evidence from human studies Carcinogen as defined by OSHA ACGIH-A1: Confirmed human carcinogen: Agent is carcinogenic to humans based on epidemiologic studies
Additional information:	RTECS contains tumorigenic and/or carcinogenic and/or neoplastic data for components in this product

12 Ecotoxicological information

Toxicity:	
Toxicity to fish:	Rainbow trout LC50: 21,000 ug/L:96H
Toxicity to daphnia and other aquatic invertebrates:	Daphnia magna EC50: 8.23 mg/L:24H
Toxicity to algae:	No data available
Persistence and degradability:	

Biodegradability:	No data available
Bioaccumulative potential:	
Bioaccumulation:	Bioconcentration factor (BCF): 236
Mobility in soil:	No data available
Other adverse effects:	Very toxic to aquatic life with long lasting effects

13 Disposal considerations

Recommendation:	Consult state, local or national regulation for proper disposal Allow professional disposal company to handle waste Must be specially treated under adherence to official regulations
Unclean packagings recommendation:	Disposal must be made according to official regulations

14 Transport information

Land transport DOT

Proper shipping name:	Arsenic trioxide
Technical name:	
DOT Hazard Class:	6.1
Subsidiary risk:	
UN Identification number:	UN1561
Label(s):	Toxic
Packing group:	II
Reportable quantity (RQ):	0.454 kg
Warning label(s):	5, 7, 12
North American Emergency Response Guidebook No.:	151
Notes:	

Air transport ICAO-TI and IATA-DGR:

Proper shipping name:	Arsenic trioxide
Technical name:	
DOT Hazard Class:	6.1
Subsidiary risk:	
UN Identification number:	UN1561
Label(s):	Toxic
Packing group:	II
Reportable quantity (RQ):	0.454 kg
Warning label(s):	5, 7, 12
North American Emergency Response Guidebook No.:	151
Notes:	FedEx requires DOT-SP-8249

UPS Ground / FedEx Ground

Proper shipping name:	Arsenic trioxide
Technical name:	
DOT Hazard Class:	6.1
Subsidiary risk:	
UN Identification number:	UN1561
Label(s):	DOT-SP-8249
Packing group:	II
Reportable quantity (RQ):	0.454 kg
Warning label(s):	5, 7, 12
North American Emergency Response Guidebook No.:	151
Notes:	DOT-SP-8249, MP 2A, 3 or 4, 173.212

UPS Air

Proper shipping name:	Arsenic trioxide
Technical name:	
DOT Hazard Class:	6.1
Subsidiary risk:	
UN Identification number:	UN1561
Label(s):	DOT-SP-8249
Packing group:	II
Reportable quantity (RQ):	0.454 kg
Warning label(s):	5, 7, 12
North American Emergency Response Guidebook No.:	151
Notes:	DOT-SP-8249; Max Qty 25 kg; MP 2A, 3 or 4; 173.212

15 Regulatory information

SARA Section 302 Extremely Hazardous components and corresponding TPQs:	Subject to established reporting levels; 100 lb TPQ (lower threshold), 10,000 lb TPQ (upper threshold)
SARA Section 311 / 312 hazards:	Acute Health Hazard, Chronic Health Hazard
SARA Section 313 components:	This product contains chemical(s) subject to the reporting requirements of Section 313 of the Emergency Planning & Community Right-to-know Act of 1986 and 40CFR372
California Proposition 65 components:	WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm
TSCA:	Product is listed on TSCA Inventory

16 Other information

The above information is accurate to the best of our knowledge. However, since data, safety standards and government regulation are subject to change and the conditions of handling and use, or misuse are beyond our control. NOAH MAKES NO WARRANTY, EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS ALL LIABILITY FOR RELIANCE THEREON. User should satisfy himself that he has all current data relevant to his particular use.

Review date: June 2, 2015

Lead Frit

FM CERAMIC SUPPLY
2741 Kimball Avenue
Pomona, California 91767
(909) 621-4421

MATERIAL SAFETY DATA SHEET

Issue Date: 12/04/2012

Product Name: CERAMIC FRIT - Lead	Product Code Name: FM-403 FRITT unground
Chemical Family	Chemical Name & Synonyms
Chemical Formula VARIABLE	Trade and Synonyms LEADED CERAMIC FRIT

I HAZARDOUS INGREDIENTS

MATERIAL OR COMPONENT	CAS No.	TLV* - TWA**	% BY WEIGHT
INORGANIC LEAD OXIDE		0.05 mg/m3 as PbO OSHA	

Threshold Limit Value TWA ** Time Weighted Average

II PHYSICAL DATA

Material is (At normal conditions) [ ] Liquid [X] Solid [ ] Gas		Appearance and Odor CLEAR GLUE	
Acidity/Alkalinity pH = N / A	Melting Point N/E °F Boilinf Point N/A °F	Specific Gravity N/E Solubility(Water) N/E	Vapor Pressure N/A

III PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection CONVENTIONAL RESPIRATORY PROTECTION	Hands, Arms and Body NOR NORMALLY REQUIRED
Eyes and Face PROTECTION IN DUSTY SITUATIONS	Other Clothing and Equipment LOCAL EXHAUST VENTILATION TO MINIMIZE DUST EXPOSURI

IV TOXICITY DATA

Inhalation	AVOID INHALATION OF DUST
Ingestion	MAY ALLOW METALS WITHIN THE FRIT TO BE LEACHED WHILE IN THE DIGESTIVE TRACK
Skin Contact	NEGLIGIBLE RISK
Eye Contact	LOW RISK, ONLY MECHANICAL INJURY
hers	

Rev'd 4/25/13

N/E = NOT ESTABLISHED N/A = NOT APPLICABI

V SAFETY INFORMATION

FIRE AND EXPLOSION DATA		
Flash Point N/A °F [X] Not Flammable	Autoignition Temperature N/A °F	Flammable Limits in air Lower N/A % Upper N/A %
Unusual and Explosion Hazard NONE	Extinguish Media NO FIRE HAZARD	
REACTIVITY		
Stability [X] Stable [ ] Unstable	Incompability (Materials to Avoid) N/E	
Conditions to Avoid		
Hazardous Decomposition Products		

VI EMERGENCY AND FIRST AID PROCEDURES

INHALATION:	REMOVE PERSON TO FRESH AIR
SKIN CONTACT	WASH WITH SOAP AND WATER
EYES:	FLUSH WITH RUNNING WATER

VII ENVIROMENTAL

Spill or Leak Procedures HANDLE AS NORMAL SOLID WASTE SCOOP UP WASTE AND PLACE IN APPROPRIATELY MARKED CONTAINERS
Waste Disposal Method WASTE MATERIAL MAY BE DISPOSED OF UNDER CONDITIONS WICH MEET FEDERAL, STATE AND LOCAL ENVIROMENTAL CONTROL REGULATIONS

VIII ADDITIONAL INFORMATION

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any representation or warranty, expresed or implied, regarding the accuracy or correctness.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knoledge. For this and other reasons, we do not assume responsability and expressly disclaim liability for loss, damage or expense arising out of or any way connected with the handling, storage, use or disposal of the product.

F·M CERAMIC SUPPLY

2741 Kimball Avenue
Pomona, California 91767
(909) 621-4421

MATERIAL SAFETY DATA SHEET

ssue Date: 12/04/2012

Product Name:	Product Code Name: unground
CERAMIC FRIT	FM-403 FRITT

0	risk minimo
1	light risk
2	moderate
3	serious
4	severe

Health	2
[illegible]	0
Reactive	0
Explosion	0
Corrosion	0

CAUTION : in can be harmful if it is inhaled by a prolonged and it coull cause dange leter to the res´piratory system

avad breathig in highly polvosas areas without the due protection

N/E = NOT ESTABLISHED N/A = NOT APPLICABLE

Revision: 5/03

Sodium Bichroma

The International Metals & Chemicals Group
METALSAMERICA/ PPBTECHNOLOGIES

MATERIAL SAFETY DATA SHEET

NUMBER: 1053

SECTION I

MANUFACTURER'S NAME: Various
(AMERICHEM as Distributor)
ADDRESS: One Pitcairn Place
165 Township Line Road
Jenkintown, PA 19046-3531
1-215-517-6000

DOT SHIPPING NAME: Toxic solids, inorganic, n.o.
(sodium bichromate), 6.1, UN3288, PGIII, RQ
CAS NUMBER: 10588-01-9
REPORTABLE QUANTITY: 10 lbs/4.54 KG

CHEMICAL NAME AND SYNONYMS:
Sodium Bichromate

TRADE NAME AND SYNONYMS:
Sodium Dichromate Crystal, Chromic Acid, Disodium Sal

CHEMICAL FAMILY/FORMULA: $Cr_2Na_2O_7 \cdot 2H_2O$
Inorganic Acid

EMERGENCY TELEPHONE NUMBER:
Chemtrec: 800-424-9300
Outside USA Call: 212-483-7616

SECTION II - HAZARDOUS INGREDIENTS

ion 313 Supplier Notification This product contains 32% Chromium and is subject to the reporting requirements of Section 31 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40 CFR 372. This information must be included Material Safety Data Sheets that are copied and distributed for this material. No other hazardous material is present in concentratic greater than 1%

SECTION III - PHYSICAL DATA

BOILING POINT:	400°C Decomposes	MELTING POINT:	356°
SPECIFIC GRAVITY (H_2O = 1)	2.34	VOLATILITY/VOL (%):	N/.
SOLUBILITY IN WATER:	at 20°C 73.0%	VAPOR PRESSURE (mm Hg.):	N/.
VAPOR DENSITY (AIR = 1)	N/A	EVAPORATION RATE (____) = 1:	N/.
DENSITY (g/cc):	N/A	FORMULA WEIGHT:	

APPEARANCE AND ODOR: Orange-red crystal, no odor

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASHPOINT (METHOD USED): Not flammable FLAMMABLE LIMITS: N/.

EXTINGUISHING MEDIA: Water spray, fog or regular foam, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES: Material is a strong oxidizer especially in presence of sulfuric acid. May ignite saw dus by prolonged contact. It will lower ignition points of combustible materials. Keep unnecessary people. Isolate hazard area and den entry. Stay upwind, out of low areas, and ventilate closed spaces before entering. Do not touch or walk through spilled material. Wea self contained breathing apparatus. Chemical protective clothing which is specifically recommended by the shipper or manufacture may be worn. It may provide little or no thermal protection. Structural firefighters' protective clothing is NOT effective for thi material. UNUSUAL FIRE AND EXPLOSION HAZARDS: Under extreme heat, it will decompose to Cr and O_2 (gas). The latte will support combustion. Move container from the fire area if you can do it without risk. Fight fire from maximum distance. Dik fire control water for later disposal. Do not scatter the material. Remove and isolate contaminated clothing at the site.

NFPA Ratings: Health(3); Flammability (1); Instability (2); Special Hazard (OX)

THRESHOLD LIMIT VALUE: OSHA PEL - TWA 1.0 mg(CrO_3)/m^3, ACGIH TLV - TWA 0.05 (Cr)/m3 NIOSH REL - TWA 0.(mg[C(VI)]/m^3. EFFECTS OF OVEREXPOSURE: Dry or wet material is corrosive to eye and skin tissue. Contact of very sm antities of dust or mist with the eyes can quickly result in severe burns. Inhalation of dust or mist can cause damage to the muc membranes, perforation of nasal septum, and irritation of the respiratory system. Skin contact can cause severe burns, external ulc and ulceration of broken skin, "chrome sores." Can be absorbed through the skin and cause systemic poisoning. Ingestion can ca burns to the digestive tract and swallowing of even a small quantity can be fatal due to burns as well as systemic effects. CHRON EFFECTS: May alter genetic material, damage to the liver, and damage to kidneys. TARGET ORGAN DATA: Lungs, thorax respiration (tumors) Tumorigenic (Carcinogenic by RTECS Criteria) Only selected registry of toxic effects of chemical substan (RTECS) data is presented here. EMERGENCY AND FIRST AID PROCEDURES: EYES: Flush eyes with water holding eyel open for 15 minutes. SKIN: Remove contaminated clothing. Speed in removing contaminated clothing is of extreme importan Flush skin with soap and water. INHALATION: Remove to fresh air. INGESTION: DO NOT INDUCE VOMITING. Do not gi anything by mouth to unconscious person. Drink plenty of milk or water. If vomiting occurs spontaneously, keep airway clear and gi more water. Effects of exposure to this product may be delayed. Keep victim under observation. SEEK MEDICAL ATTENTION THE EVENT OF ANY ACCIDENTAL EXPOSURE TO THIS PRODUCT. IMMEDIATE ADMINISTRATION OF 1 GRA ASCORBIC ACID (effervescent form) by mouth is recommended. CARCINOGENICITY INFORMATION: IVARC WARNIN Hexavalent Chromium Compounds are suspected carcinogens. This product is TSCA listed.

SECTION VI - REACTIVITY DATA

STABILITY: Stable INCOMPATIBILITY (MATERIALS TO AVOID): This product is a strong oxidizing agent. It may react wi easily oxidizable/combustible materials especially at elevated temperatures. Both in dry form and in solution this material may violent react with organic materials such as grease and oil especially in a confined space.
HAZARDOUS DECOMPOSITION PRODUCTS: When heated to decomposition it emits toxic fumes of Na_2O. HAZARDOU POLYMERIZATION: Will not occur. CONDITIONS TO AVOID: Avoid storage with incompatible materials and excessive hea

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Solids may be shoveled into drums for reuse or disposa Spilled liquid material should be contained, absorbed with an inert absorbent such as vermiculite, sand or soil and then shoveled or swe into a closed metal container for disposal. All visible spilled material must be removed as outlined above. WASTE DISPOSA METHOD: Sodium Bichromate must not be discharged into sewers or navigable waters or allowed to contaminate underground wat sources. Waste should be reclaimed, if possible. If reclamation is not possible contact local waste disposal contractor or perform th following: (1) Carefully and slowly dissolve in plenty of water. Handle solution carefully - can cause severe burns. (2) Reduce trivalent chromium by mixing with reducing agents such as ferrous sulfate. (3) Adjust pH to 8.5 with sodium carbonate to precipita the trivalent chromium as chromium hydroxide. (4) Filter and dry the precipitated chromium hydroxide and dispose of by burying an approved, secured hazardous waste landfill, or contact local waste disposal contractor for disposal.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE): Positive pressure self-contained breathing apparatus.
OTHER PROTECTIVE EQUIPMENT:

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Store in dry area. When handling, wear rubber gloves, boots an apron, goggles, long-sleeved shirts and hard hat. Respiratory protection where exposure may be above OSHA permissible exposur limit. Keep container closed when not in use. Store away from flammable or combustible materials. OTHER PRECAUTIONS: A containers should be kept tightly sealed to avoid moisture pickup. Do not recycle or reuse container. Dispose of empty container i accordance with local, state and federal regulations. Since the actual use by others is beyond the control of The International Metal & Chemicals Group, users must take precautions to ensure that the environmental controls are adequate to maintain the permissibl exposure limits applicable.

SAFETY DATA SHEET

SECTION 1 - IDENTIFICATION

PRODUCT NAME: JMB CADMIUM PIGMENT CP6350

US D.O.T. / UN NAME: NOT REGULATED FOR TRANSPORT

RECOMMENDED USES: PIGMENT FOR USE IN PLASTICS, ARTISTS' COLORS, PAINTS; COLORING MATERIAL FOR USE IN CERAMICS AND GLASS
NOT FOR USE IN TATTOO INKS, COSMETICS, ANY MEDICAL RELATED APPLICATIONS

COMPANY:
UNITED MINERAL & CHEMICAL CORPORATION
1050 Wall Street West, Ste. 660, Lyndhurst, NJ 07071
Tel: 201-507-3300 Fax: 201-507-1506
e-mail: inquiry@umccorp.com

EMERGENCY TELEPHONE NO.:
USA – CHEMTREC: 1-800-424-9300
OUTSIDE USA: +1 703-527-3887

SECTION 2 – HAZARD IDENTIFICATION

GHS HAZARD CLASSIFICATION:
NOT CLASSIFIED
GHS LABEL ELEMENTS:
SIGNAL WORD: NO SIGNAL WORD
LABEL CODES / PICTOGRAMS: NO PICTOGRAMS
HAZARD STATEMENTS: NONE UNDER GHS CLASSIFICATION

PRECAUTIONARY STATEMENTS :

PREVENTION : NONE ASSIGNED UNDER GHS
RESPONSE : NONE ASSIGNED UNDER GHS
STORAGE : NONE ASSIGNED UNDER GHS
DISPOSAL : NONE ASSIGNED UNDER GHS

OTHER HAZARDS / U.S. - HAZARDS NOT OTHERWISE CLASSIFIED / UN GHS - OTHER HAZARDS WHICH DO NOT RESULT IN CLASSIFICATION: SEE 29 CFR 1910.1027 FOR THE OSHA CADMIUM STANDARD

NOTE – CADMIUM PIGMENTS ARE MUCH LESS HAZARDOUS THAN OTHER CADMIUM COMPOUNDS AS THEY ARE EXTREMELY INSOLUBLE. THIS GREATLY REDUCES THE RISK OF ABSORTION OF CADMIUM INTO THE BODY AND ALSO GREATLY REDUCES THEIR ENVIRONMENTAL HAZARD. AS SUCH, THE PRODUCER - JAMES M. BROWN LTD. – HAS NOT CLASSIFIED THEIR CADMIUM PIGMENTS AS HAZARDOUS UNDER THE GHS SYSTEM FOR THE US OR UNDER EU REACH STANDARDS. THE CATEGORY "CADMIUM AND CADMIUM COMPOUNDS" IS REGULATED UNDER VARIOUS U.S. LAWS (SARA 313, CERCLA, RCRA, OSHA CADMIUM STANDARD AT 29 CFR 1910.1027, CALIFORNIA PROPOSITION 65, VARIOUS STATE LISTS, ETC.) AS INDICATED ON THIS SAFETY DATA SHEET.

PER THE OSHA CADMIUM STANDARD - DO NOT EAT, DRINK, SMOKE, CHEW TOBACCO OR GUM, OR APPLY COSMETICS IN REGULATED AREAS, CARRY THE PRODUCTS ASSOCIATED WITH THESE ACTIVITIES INTO REGULATED AREAS, OR STORE SUCH PRODUCTS IN THOSE AREAS. (REGULATED AREA = AREA WHEREVER AN EMPLOYEE'S EXPOSURE TO AIRBORNE CONCENTRATIONS OF CADMIUM IS, OR CAN REASONABLY BE EXPECTED TO BE IN EXCESS OF THE PERMISSIBLE EXPOSURE LIMIT - SEE SECTION 8)

SECTION 3 – COMPOSITION / INFORMATION ON INGREDIENTS

CHEMICAL COMPOSITION:	COMPONENTS:	CAS NO.	%
	AS MIXTURES, ALL COLORS MAY CONTAIN (SEE NOTE 1):		25-100
	C.I. PIGMENT RED 108 – CADMIUM SULFOSELENIDE RED	58339-34-7	
	C.I. PIGMENT ORANGE 20 – CADMIUM SULFOSELENIDE ORANGE	12656-57-4	
	C.I. PIGMENT YELLOW 35 - CADMIUM ZINC SULFIDE YELLOW	8048-07-5	
	PLUS		
	C.I. PIGMENT WHITE 21 – BARIUM SULFATE (SEE NOTE 2)	7727-43-7	0-75

SYNONYMS: AS LISTED UNDER COMPONENTS
CHEMICAL FAMILY: INORGANIC PIGMENTS

Rec'd 5/26/15

NOTE 1: THESE SUBSTANCES ARE SPECIFICALLY EXCLUDED FROM THE SPECIFIC CLASSIFICATION AND LABELLING ENTRIES IN THE GHS TABLE COVERING CADMIUM COMPOUNDS. THEY HAVE BEEN SELF-CLASSIFIED BY THE PRODUCER AS NOT HAZARDOUS ON THE BASIS OF THEIR PHYSICAL AND CHEMICAL PROPERTIES – PARTICULARLY THEIR EXTREME INSOLUBLITY. A RISK ASSESSMENT CONDUCTED BY THE EU CONCLUDED THAT THESE PRODUCTS OFFER NO SIGNIFICANT HAZARD TO EITHER HUMAN HEALTH OR THE ENVIRONMENT. THEIR REACH REGISTRATION HAS CONFIRMED THAT NO CLASSIFICATIONS APPLY – EITHER FOR HUMAN HEALTH OR THE ENVIRONMENT.

NOTE 2: BARIUM SULFATE IS PRESENT IN EXTENDED / REDUCED STRENGTH (LITHOPONE-LIKE) PIGMENTS/COLORS. IT MAY ALSO BE PRESENT AT LOWER LEVELS IN CADMIUM "PURE" TYPE PIGMENTS TO CONTROL STRENGTH TO CUSTOMERS' STANDARDS.

SECTION 4 – FIRST AID MEASURES

FIRST AID/ RESPONSE **FIRST AID RESPONDERS SHOULD WEAR PERSONAL PROTECTIVE EQUPMENT**

SKIN : IF ON SKIN: PROMPTLY WASH OFF WITH SOAP & WATER. REMOVE CONTAMINATED CLOTHING. GET MEDICAL ADVICE/ATTENTION IF IRRITATION OCCURS. WASH CONTAMINATED CLOTHING BEFORE REUSE.

EYES : IF IN EYES: RINSE CAUTIOUSLY WITH WATER FOR SEVERAL MINUTES. REMOVE CONTACT LENSES, IF PRESENT AND EASY TO DO. CONTINUE RINSING. GET MEDICAL ADVICE/ATTENTION IF IRRITATION OCCURS.

INHALATION : IF INHALED: REMOVE VICTIM TO FRESH AIR AND KEEP AT REST IN A POSITION COMFORTABLE FOR BREATHING. GET MEDICAL ADVISE / ATTENTION IF ANY ADVERSE SYMPTOMS OCCUR.

INGESTION : IF SWALLOWED: RINSE MOUTH WITH WATER, THEN DRINK WATER TO DILUTE. INDUCE VOMITING ONLY UNDER THE DIRECTION OF MEDICAL PERSONNEL. NEVER GIVE ANYTHING BY MOUTH IF THE VICTIM IS UNCONSCIOUS. GET MEDICAL ATTENTION IF LARGE QUANTITY IS INGESTED OR IF YOU FEEL UNWELL.

MOST IMPORTANT SYMPTOMS/EFFECTS, ACUTE AND DELAYED

AS INORGANIC POWDER, INHALATION OF DUST MAY CAUSE DRYNESS OF MOUTH, COUGHING; DUST CONTACT EYES MAY CAUSE IRRITATION / SORENESS. NO SYMPTOMS EXPECTED FROM SKIN CONTACT OTHER THAN TEMPORARY COLORATION OF THE AFFECTED AREA. INGESTION MAY CAUSE SLIGHT IRRITATION OF MOUTH AND THROAT.

INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED, IF NECESSARY

CALL A POISON CENTER/DOCTOR/PHYSICIAN IN THE EVENT OF MAJOR INHALATION OR INGESTION

SECTION 5 – FIRE FIGHTING MEASURES

SUITABLE EXTINGUISHING MEDIA : **WATER** : (X-AS FOG) **FOAM** : (X) **CO_2**: (X) **DRY CHEMICAL**: (X)
NON-FLAMMABLE – USE MEDIA SUITABLE FOR THE SURROUNDING AREA

SPECIFIC HAZARDS IN CASE OF FIRE : FIRE CONDITIONS MAY EMIT TOXIC / IRRITATING FUMES (CADMIUM OXIDE, SULFUR DIOXIDE) AND GASES (SULFUR DIOXIDE) UPON THERMAL DECOMPOSITION.

SPECIAL PROTECTIVE EQUIPMENT & PRECAUTION FOR FIRE FIGHTERS : IN CASE OF FIRE INVOLVING THIS MATERIAL, DO NOT ENTER THE FIRE AREA WITHOUT FULL PROTECTIVE EQUIPMENT INCLUDING SELF-CONTAINED BREATHING APPARATUS. STAY UPWIND AND ISOLATE THE AREA OF THOSE WITHOUT PROTECTIVE EQUIPMENT/ RESPIRATORY PROTECTION. COLLECT ALL FIRE CONTROL WATER FOR PROPER DISPOSAL – DO NOT ALLOW IT TO ENTER DRAINS OR WATERWAYS.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS: WEAR FULL PROTECTIVE EQUIPMENT (SEE SECTION 8). KEEP UNPROTECTED PERSONNEL OUT OF THE AREA. REMOVE CONTAMINATED CLOTHING/EQUIPMENT AND WASH THOROUGHLY AFTER HANDLING / CLEANING THE SPILL.

ENVIRONMENTAL PRECAUTIONS: DO NOT RELEASE TO SEWERS, WATERWAYS AND THE ENVIRONMENT. DISPOSE OF PROPERLY VIA LICENSED CHEMICAL WASTEHAULER (SEE SECTION 13).

METHODS AND MATERIAL FOR CONTAINMENT AND CLEAN UP: SCOOP, SHOVEL OR USE A VACUUM WITH A HEPA FILTER TO COLLECT SPILL. AVOID GENERATING DUST; IF NEEDED LIGHTLY DAMP DOWN MATERIAL WITH WATER TO CONTROL DUST LEVELS. PLACE INTO A PROPERLY LABELED IMPERMEABLE BAG/CONTAINER AND SEAL. MATERIAL WILL BE CLASSIFIED AS RCRA HAZARDOUS WASTE AND MUST BE LABELLED IN ACCORDANCE WITH THE OSHA CADMIUM STANDARD - 29 CFR 1910.1027(m)(3)(ii).

SECTION 7 – HANDLING & STORAGE

PRECAUTIONS FOR SAFE HANDLING: WEAR FULL PROTECTIVE EQUIPMENT (SEE SECTION 8). USE WITH ADEQUATE VENTILATION. AVOID SCATTERING INTO THE AIR / GENERATING DUST. CLEAN SPILLS PROMPTLY AND AVOID RELEASE TO THE SEWER SYSTEM/ WATERWAYS/ENVIRONMENT. EMPLOY GOOD HOUSEKEEPING TECHNIQUES TO CONTROL DUST BUILD-UP ON EQUIPMENT AND WORK AREA. REMOVE CONTAMINATED EQUIPMENT/CLOTHING AND WASH THOROUGHLY AFTER HANDLING. KEEP CONTAINER SEALED WHEN NOT IN USE. DO NOT EAT, DRINK, SMOKE, CHEW TOBACCO OR GUM, APPLY COSMETICS WHILE HANDLING OR IN WORK AREA USING THIS PRODUCT.

CONDITIONS FOR SAFE STORAGE, INCLUDING INCOMPATIBILITIES: STORE ONLY IN THE ORIGINAL SEALED CONTAINERS IN A COOL, DRY AREA. STORE AWAY FROM FOOD, DRINK, ANIMAL FEEDSTUFFS. STORE AWAY FROM IGNITION SOURCES, CONCENTRATED ACIDS AND POWERFUL OXIDIZING AGENTS.

SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

CONTROL PARAMETERS: **SEE 29 CFR 1910.1027 FOR THE OSHA CADMIUM STANDARD**

EXPOSURE LIMITS: U.S. OSHA PEL : 0.0025 mg/m^3 TWA ACTION LEVEL AS Cd; 0.005 mg/m^3 TWA, AS Cd; 0.2 mg/m^3 TWA AND 0.6 mg/m^3 CEILING LIMIT AS Cd DUST FOR DRY COLOR FORMULATORS; 0.2 mg/m^3 TWA SELENIUM COMPOUND AS Se; 15 mg/m^3 TWA TOTAL DUST AS BARIUM SULFATE, 5 mg/m^3 TWA RESPIRABLE FRACTION AS BARIUM SULFATE

U.S. ACGIH TLV : 0.01 mg/m^3 TWA, INHALABLE AS Cd, 0.002 mg/m^3 TWA RESPIRABLE AS Cd; 0.2 mg/m^3 TWA SELENIUM COMPOUND, AS Se; 10 mg/m^3 TWA TOTAL DUST AS BARIUM SULFATE

APPROPRIATE ENGINEERING CONTROLS : USE LOCAL / MECHANICAL EXHAUST TO MAINTAIN AIR CONCENTRATIONS BELOW OCCUPATIONAL EXPOSURE STANDARDS (SEE ABOVE)

PERSONAL PROTECTIVE EQUIPMENT:

RESPIRATORY PROTECTION : HALF MASK AIR-PURIFYING RESPIRATOR EQUIPPED WITH A HIGH EFFICIENCY PARTICULATE AIR FILTER FOR AIRBORNE CONCENTRATIONS UP TO TEN TIMES THE PERMISSIBLE EXPOSURE LIMIT (SEE 29 CFR 1910.1027(g) FOR PROPER EQUIPMENT FOR HIGHER EXPOSURE LEVELS)

HAND PROTECTION : USE CHEMICAL RESISTANT GLOVES (RUBBER, PVC)

EYE PROTECTION : VENTED GOGGLES OR FULL FACE SHIELD OR OTHER APPROPRIATE PROTECTIVE EQUIPMENT THAT COMPLIES WITH 29 CFR1910.133; ACCESS TO AN EYEWASH FOUNTAIN

OTHER PROTECTIVE EQUIPMENT : LABCOAT; COVERALLS TO PROTECT SKIN; HEAD COVERINGS, BOOTS OR FOOT COVERINGS; ACCESS TO A SAFETY DRENCH SHOWER

SECTION 9- PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE :	YELLOW, ORANGE, RED OR MAROON COLORED POWDER		
		FLAMMABLE LIMITS :	LEL:& UEL: (N/A)
ODOR :	NO ODOR	**VAPOR PRESSURE (mm Hg) :**	N/A
ODOR THRESHOLD :	N/A	**VAPOR DENSITY (AIR=1) :**	N/A
pH (5% IN WATER) :	APPROX. 7	**RELATIVE DENSITY/SPECIFIC GRAVITY :**	**3.5 – 5.5**
MELTING POINT / FREEZING POINT (°C) :	N/A	**SOLUBILITY IN WATER (@20°C) :**	INSOLUBLE
BOILING POINT (°C) :	N/A	**PARTITION COEFFICIENT(n-OCTANOL/WATER) :**	NO DATA AVAILABLE
FLASH POINT (°F) :	N/A	**AUTO IGNITION TEMP. (°C) :**	NOT KNOWN
EVAPORATION RATE :	N/A	**DECOMPOSITION TEMP. :**	**>300** (572°F)
FLAMMABILITY :	NOT FLAMMABLE	**VISCOSITY :**	N/A

SECTION 10 – STABILITY AND REACTIVITY

REACTIVITY :	MAY REACT WITH STRONG ACIDS YIELDING TOXIC/FLAMMABLE HYDROGEN SULFIDE GAS, TOXIC HYDROGEN SELENIDE AND POSSIBLY SOLUBLE TOXIC CADMIUM SALTS
CHEMICAL STABILITY :	STABLE WHEN STORED IN SEALED PACKAGE UNDER RECOMMENDED STORAGE CONDITIONS
POSSIBLITY OF HAZARDOUS REACTIONS :	HAZARDOUS POLYMERIZATION WILL NOT OCCUR
CONDITIONS TO AVOID :	CONTACT WITH INCOMPATIBLES; HIGH HEAT (≥0°C or 536°F); DUST IN VICINITY OF IGNITION SOURCES, ELECTRICAL OR SPARK GENERATING EQUIPMENT
INCOMPATIBLE MATERIALS :	CONCENTRATED ACIDS, STRONG OXIDIZING AGENTS
HAZARDOUS DECOMPOSITION PRODUCTS :	FIRE/THERMAL DECOMPOSITON CAN PRODUCE HAZARDOUS FUMES (CADMIUM OXIDE, SELENIUM DIOXIDE) AND GASES (SULFUR DIOXIDE)

SECTION 11 – TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS:

ROUTES OF EXPOSURE :	SKIN, EYES, INHALATION, INGESTION
SKIN, EYES, INHALATION :	INHALATION OF DUST MAY CAUSE RESPIRATORY IRRITATION. DUST CONTACT WITH EYES MAY CAUSE IRRITATION.
INGESTION :	THIS ROUTE OF EXPOSURE IS NOT LIKELY. NO KNOWN EFFECTS.
CHRONIC:	GROSS OVEREXPOSURE OVER MANY YEARS MAY LEAD TO KIDNEY DAMAGE BUT THIS SHOULD NEVER HAPPEN GIVEN MODERN WORKING CONDITIONS
ACUTE TOXICITY :	A RANGE OF VAULES HAVE BEEN REPORTED FOR SEVERAL SPECIES. ORAL LD_{50} VALUES ARE NORMALLY >5000 mg/kg
SKIN CORROSION / IRRITATION :	NOT EXPECTED TO BE IRRITATING
SERIOUS EYE DAMAGE / IRRITATION :	NO TEST DATA AVAILABLE; MAY CAUSE IRRITATION BUT BELOW GHS CLASSIFICATION
RESPIRATORY OR SKIN SENSITIZATION :	NOT EXPECTED TO BE SENSITIZING
GERM CELL MUTAGENICITY :	NO TEST DATA AVAILABLE; PRODUCER HAS NOT CLASSIFIED AS MUTAGEN
CARCINOGENICITY :	U.S. LISTED CARCINOGEN: NONE () OSHA (*) NTP (*) IARC (*) OTHER (*) AS GENERIC CLASS OF "CADMIUM AND CADMIUM COMPOUNDS": OSHA-Ca: CARCINOGEN DEFINED WITH NO FURTHER CATEGORIZATION; NTP-K: KNOWN TO BE A HUMAN CARCINOGEN; IACR-1: CARCINOGENIC TO HUMANS PRODUCER HAS ASSIGNED NO GHS CLASSIFICATION DUE TO THE EXTREME INSOLUBILITY OF CADMIUM PIGMENTS AS COMPARED TO OTHER CLASSIFED SOLUBLE COMPOUNDS
REPRODUCTIVE TOXICITY :	NO GHS HAZARD CLASSIFICATION
SPECIFIC TARGET ORGAN TOXICITY :	SINGLE EXPOSURE: NO GHS HAZARD CLASSIFICATION; REPEATED/CHRONIC EXPOSURE: NO GHS HAZARD CLASSIFICATION-GROSS OVEREXPOSURE OVER MANY YEARS MAY LEAD TO KIDNEY DAMAGE
ASPIRATION HAZARD :	NO DATA AVAILABLE; NO GHS HAZARD CLASSIFICATION
INTERACTIVE EFFECTS:	NO DATA AVAILABLE

SECTION 12 – ECOLOGICAL INFORMATION

ECOTOXICITY :	THE EXTREME INSOLUBILITY OF THESE PIGMENTS INDICATE THAT THEY OFFER NO SIGNIFICANT HAZARD. NO ACTUAL TESTING HAS BEEN DONE AND AS SUCH, IT IS RECOMMENDED TO AVOID RELEASE TO THE ENVIRONMENT AND WATERWAYS.
TOXICITY - AQUATIC :	NO TEST DATA AVAILABLE
TOXICITY TO DAPHNIA :	NO TEST DATA AVAILABLE
TOXICITY - TERRESTIAL :	NO TEST DATA AVAILABLE
PERSISTANCE & DEGRADABILITY:	HIGHLY STABLE INSOLUBLE INORGANIC COMPOUND – NOT EXPECTED TO DEGRADE IN THE ENVIRONMENT; NOT WITHIN THE DEFINITION OF PBT OR vPvB
BIOACCUMULATIVE POTENTIAL :	HIGHLY INSOLUBLE IN BOTH WATER AND ALL ORGANIC SOLVENTS – NOT EXPECTED TO BIOACCUMULATE
MOBILITY IN SOIL :	MOVEMENT OF THESE HIGHLY INSOLUBLE PRODUCTS THROUGH THE SOIL WILL ONLY OCCUR BY PHYSICAL MOVEMENT OF THE MATERIAL ITSELF.
OTHER ADVERSE EFFECTS :	NO FURTHER DATA AVAILABLE

SECTION 13 – DISPOSAL CONSIDERATIONS

DISPOSAL METHODS:
DISPOSE OF CONTENTS / CONTAINER IN ACCORDANCE WITH LOCAL, REGIONAL, NATIONAL, INTERNATIONAL REGULATIONS. DISPOSE OF IN SEALED, IMPERMEABLE CONTAINERS, USING A LICENSED CHEMICAL WASTE HAULER. PER THE OSHA CADMIUM STANDARD, THE WARNING LABELS FOR CONTAINERS OF CONTAMINATED PROTECTIVE CLOTHING, EQUIPMENT, WASTE, SCRAP, OR DEBRIS SHALL INCLUDE AT LEAST THE FOLLOWING INFORMATION: DANGER CONTAINS CADMIUM MAY CAUSE CANCER CAUSES DAMAGE TO LUNGS AND KIDNEYS AVOID CREATING DUST

SECTION 14 – TRANSPORT INFORMATION

BY ROAD OR RAIL - U.S. D.O.T. REGULATED: **YES ()** **NO (X)** **RQ:** (N/A)
IF REGULATED, UN PROPER SHIPPING NAME: HAZARD CLASS: ()
UN IDENTIFICATION NO.: () PACKING GROUP: () LABEL REQUIRED: ()
U.S. MARINE POLLUTANT: **YES ()** **NO (X*)** SEVERE U.S. MARINE POLLUTANT: **YES ()** **NO (X)**
EMERGENCY RESPONSE GUIDE NO.: ()
INLAND B/L:
*THOUGH THE GENERIC CATEGORY OF "CADMIUM AND CADMIUM COMPOUNDS" IS ON THE U.S. MARINE POLLUTANT LIST, CADMIUM PIGMENTS ARE NOT UN CLASSIFIED MARINE POLLUTANTS.

BY SEA - IMDG REGULATED: **YES ()** **NO (X)** STOWAGE CATEGORY: N/A
BY AIR - IATA REGULATED: **YES ()** **NO (X)** PKG INSTRUCTION NO.: N/A
SPECIAL PRECAUTIONS: READ SDS BEFORE HANDLING

SECTION 15 – REGULATORY INFORMATION

U.S. TSCA: WE CERTIFY THAT ALL COMPONENTS OF THIS PRODUCT ARE REGISTERED UNDER THE REGULATIONS OF THE TOXIC SUBSTANCES CONTROL ACT.

U.S. SARA TITLE III, SECT. 313 : **LISTED (X*)** **NOT LISTED ()** *ALL COLORS ARE LISTED AS CADMIUM COMPOUNDS.
YELLOWS ARE ALSO LISTED AS ZINC COMPOUNDS.
ORANGES, REDS, MAROONS ARE ALSO LISTED AS SELENIUM COMPOUNDS.

U.S. RCRA HAZARDOUS WASTE : **NO (*)** **YES ()** **RCRA # : (*)** *WASTE PRODUCT SHOULD BE TESTED (TCLP METHOD) TO SEE IF IT MEETS THE DEFINITION OF UNLISTED HAZARDOUS WASTE, CHARACTERISTIC OF TOXICITY FOR CADMIUM, D006. THE PIGMENT ITSELF, DUE TO ITS HIGH INSOLUBILITY, DOES NOT MEET THE SOLUBLE LEVEL FOR CADMIUM TO BE CLASSIFIED AS RCRA HAZARDOUS WASTE. WASTE LABELLING IS STILL REQUIRED UNDER THE OSHA CADMIUM STANDARD (SEE SECTION 13).

U.S. CERCLA : **NO ()** **YES (X*)** **RQ (*)** *AS PART OF THE GENERIC CATEGORY "CADMIUM AND COMPOUNDS" WITH NO RQ ASSIGNED TO THE GENERIC BROAD CLASS

U.S. CALIFORNIA PROPOSITION 65 LISTED : **YES (X*)** **NO ()** *AS PART OF THE GENERIC CATEGORY "CADMIUM AND COMPOUNDS"

HMIS: HEALTH (2) FLAMMABILITY (0) REACTIVITY (0)

SECTION 16 – OTHER INFORMATION

REVISION DATE: MAY 22, 2015 **PREPARED BY:** EHSA COORDINATOR / UNITED MINERAL & CHEMICAL CORP.

ABBREVIATIONS / ACRONYMS: **N/A**=NOT APPLICABLE; **LEL**=LOWER EXPLOSION LIMIT; **UEL**=UPPER EXPLOSION LIMIT; **PEL**=PERMISSIBLE EXPOSURE LIMIT; **STEL**=SHORT TERM EXPOSURE LIMIT; **TLV**=THRESHOLD LIMIT VALUE; **TWA**=TIME WEIGHTED AVERAGE OVER 8 HOUR WORKDAY; **LD_{50}** OR **LC_{50}**=LETHAL DOSE OR LETHAL CONCENTRATION THAT KILLS 50% OF DOSED GROUP; **mg**=MILLIGRAM; **g**=GRAM; **kg**=KILOGRAM; **PPM**=PARTS PER MILLION; **m**=METER; **LOAEL**=LOWEST OBSERVED ADVERSE EFFECT LEVEL; **C.I.**=COLOUR INDEX

IN ACCORDANCE WITH GOOD PRACTICES OF PERSONAL HYGIENE, HANDLE WITH DUE CARE AND AVOID ANY UNNECESSARY CONTACT WITH THIS PRODUCT. USE RECOMMENDED PERSONAL PROTECTION WHEN HANDLING (SEE SECTION 8).

THIS INFORMATION IS BEING SUPPLIED TO YOU UNDER OSHA "RIGHT TO KNOW" REGULATION 29 CFR 1910.1200 AND IS OFFERED IN GOOD FAITH AS TYPICAL VALUES AND NOT AS PRODUCT SPECIFICATION. THE INFORMATION IS BELIEVED TO BE TRUE AND ACCURATE. NO WARRANTY, EXPRESSED OR IMPLIED, REGARDING THE ACCURACY OF THIS DATA, THE HAZARD CONNECTED WITH USE OF THE MATERIAL, OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF, IS MADE. UNITED MINERAL & CHEMICAL CORPORATION AND ITS SUPPLIERS ASSUME NO RESPONSIBILITY FOR DAMAGE OR INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN.
UNITED MINERAL & CHEMICAL CORPORATION

Material Safety Data Sheet RESOURCE ALLOYS & METALS, INC.

Chemical Name	Common Name
Selenium	Selenium

Section I

Manufacturer's Name	Emergency Telephone Number
Resource Alloys and Metals, Inc.	561/790-7200
Address	**Telephone Number for Information**
250 Business Parkway, Suite 1	561/790-7200
Royal Palm Beach, FL 33411	**Date Prepared** 08/01/05

Rec'd 11/5/13

Section II – Hazard Ingredients/Identity Information

Hazardous Components	OSHA PEL (mg/m³) TWA	OSHA PEL (mg/m³) Ceiling	ACGIH TLV (mg/m³) TWA	ACGIH TLV (mg/m³) STEL	%
Selenium	0.2	none	0.2	none	>99.5

Section III – Physical/Chemical Characteristics

Boiling Point	1265° F	**Specific Gravity (H_2O = 1)**	4.81
Vapor Pressure (mm Hg.)	1 @ 673° F	**Melting Point**	423° F
Vapor Density (AIR = 1)	NA	**Evaporation Rate**	NA
Solubility in Water	Not soluble	**Appearance and Odor**	Steel gray, odorless solid

Section IV – Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
NA	Not flammable	NA	NA

Extinguishing Media
Class D fire extinguisher, dry chemical or dry sand. Do not use water.

Special Fire Fighting Procedures
Do not use water. Wear SCB apparatus if necessary.

Unusual Fire and Explosion Hazards
Dust may generate fire. Never use water on molten metal or charge wet metal or explosion will occur.

Section V – Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable (at room temp)	X	Wet or humid conditions

Incompatibility (Materials to Avoid)
Avoid contact with oxidizing agents. Avoid water with molten metal.

Hazardous Decomposition or Byproducts
At elevated temperatures, toxic oxide fumes may be evolved.

Section VI – Health Hazard Data

Route[s] of Entry:	Inhalation?	Skin?	Ingestion?	Eye Contact?
	yes	yes	yes	yes

Health Hazards
Cutting, melting, welding, soldering, or mechanical processing may produce dusts or fumes containing selenium and/or its oxides. Breathing these dusts or fumes may present potentially significant health hazards. Dusts or fumes containing selenium may cause skin or eye irritation. Ingestion of significant amounts of material is unlikely.

Carcinogenicity:	NTP?	IARC?	OSHA?
	yes	no	no

Signs and Symptoms of Exposure
Headache, chills, fever, metallic taste or garlic breath.

Medical Conditions Generally Aggravated by Exposure
Diseases of the kidneys, skin, liver, lungs and gastrointestinal tract.

Emergency and First Aid Procedures
Eye and skin contact – flush eyes with large amounts of water for at least 15 minutes; wash affected area with large amounts of water and soap. *Inhaled* – remove to fresh air. *Ingested* – Induce vomiting, give water or milk. In each case, seek medical attention following immediate care.

Section VII – Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled

If metal is in a molten state, avoid contact with water or moisture. If it is in a solid state, be careful of sharp edges. Vacuum dust.

Precautions to be Taken in Handling and Storing

Use good housekeeping practices to prevent accumulations of dust and keep airborne dust concentrations at a minimum. Avoid breathing dust or fumes. Store metal in a dry area away from incompatible materials. Keep dust away from sources of ignition. Preheat metal when required to evaporate surface moisture prior to melting. Ice, snow, grease, oil or moisture can cause explosions. Remove these contaminants before charging ingot to melting furnace.

Other Precautions

Use safe foundry practices.

Section VIII – Control Measures

Respiratory Protection

A mask/full-face respirator should be worn if air contaminant concentrations exceed exposure limits or if excessive dust concentrations occur.

Ventilation

Provide ventilation necessary to maintain concentrations of air contaminants below recommended levels.

Eye Protection

Goggles should be worn if excessive dust concentrations occur and when working with molten metal.

Protective Clothing

Gloves should be worn to avoid cuts and during operations with significant skin contact (i.e. grinding). Full protective clothing should be worn by workers exposed to heavy concentrations of dust or high heat and during alloying operations to prevent injury from molten metal splashing, spilling, etc.

Work/Hygienic Practices

As necessary to maintain exposures below TLVs and PELs and follow good normal hygienic practices.